There shall be no wastes discharged to such waters at any time which after suitable treatment, raise the temperature of the receiving waters more than one degree Fahrenheit (1°F) at the perimeter of a designated thermal mixing zone. Turbidity levels shall not exceed 10 Jackson Turbidity Units as a result of any discharge or activity.

(2) Water Management Type II: Rivers, streams, brooks and creeks containing mixed populations of rainbow trout, brown trout and smallmouth bass. The dissolved oxygen content of these waters shall be not less than 6 mg/l and the normal seasonal, daily and diurnal variations above this dissolved oxygen limit shall be maintained. There shall be no wastes discharged to such waters at any time which, after suitable treatment, raise the temperature of the receiving waters more than one degree Fahrenheit (1°F) at the perimeter of a designated thermal mixing zone. Turbidity levels shall not exceed 10 Jackson Turbidity Units as a result of any discharge or activity.

(3) Water Management Type III: Rivers, streams, brooks and creeks containing mixed populations of such warm water species of fish as smallmouth bass, perch and bluegills. The dissolved oxygen content of these waters shall be not less than 5 mg/l and the normal seasonal daily and diurnal variations above this dissolved oxygen limit shall be maintained. Turbidity levels shall not exceed 25 Jackson Turbidity Units as a result of any discharge or activity.

Heated wastes may be discharged into these waters in accordance with the requirements of the following table, which sets forth in column one a range of maximum temperatures during any twenty-four (24) hour period as they occur immediately upstream of the discharge, and in column two sets forth the maximum increase in the stream temperature, resulting from such discharges, that will then be permitted during the subsequent twenty-four (24) hour period as measured at the downstream perimeter of the designated thermal mixing zone:

Column 1 Maximum River Temp.	Column 2 Allowable Increase in Temperature
Above 66° F.	1°F.
63° to 66° F.	2°F.
59° to 62° F.	3°F.
55° to 58° F.	4°F.
Below 55° F.	5° F.

The rate of temperature change associated with the discharge of heated wastes, upward or downward, shall be controlled so as to preclude significant adverse effects on the aquatic ecosystem resulting from either heat shock or cold shock.

(4) Water Management Type IV: Oligotrophic lakes, ponds and reservoirs sustaining natural populations of brook trout, brown trout, rainbow trout, lake trout, salmon and other associated species. The dissolved oxygen content of these waters shall be maintained at not less than 6 mg/l and the normal seasonal daily and diurnal variations above this dissolved oxygen limit shall be maintained. Turbidity levels shall not exceed 10 Jackson Turbidity Units as a result of any discharge or activity.

There shall be no wastes discharged to such waters at any time which raise the temperature of the receiving waters more than one degree Fahrenheit ($1^{o}F$) at the perimeter of a designated thermal mixing zone. No water shall be discharged to the hypolimnion of Type IV waters. The withdrawal of water from the hypolimnion of Type IV waters shall be permitted only for public water supply or for the enhancement or maintenance of fish and/or wildlife habitat.

(5) Water Management Type V: Lakes, ponds and reservoirs or portions thereof not designated by this rule as Type IV waters. These waters are to be managed so that their dissolved oxygen content shall be not less than 5 mg/l and the normal seasonal, daily and diurnal variations above this dissolved oxygen limit shall be maintained. Turbidity levels shall not exceed 25 Jackson Turbidity Units as a result of any discharge or activity.

Heated wastes may be discharged into these waters in accordance with the requirements of the following table which sets forth in column one a range of maximum temperatures during any twenty-four (24) hour period as they may occur outside the perimeter of a designated thermal mixing zone and sets forth in column two the maximum increase in temperature resulting from such discharges that will be permitted during the subsequent twenty-four (24) hours as measured at the perimeter of a designated thermal mixing zone:

Column 1 Lake Temperature	Column 2 Allowable Increase in Temperature
Above 60°F.	1° F.
60° - 50° F.	2° F.
Below 50° F.	3° F.

The rate of temperature change associated with the discharge of heated wastes upward or downward, shall be controlled so as to preclude significant adverse effects on the aquatic ecosystem resulting from either heat shock or cold shock. Any discharge to the hypolimnion of Type V waters is prohibited. The withdrawal of water from the hypolimnion of such waters shall be permitted only for public water supply or for the enhancement or maintenance of fish and/or wildlife habitat.

B. Intrastate Waters:

The State's intrastate streams, rivers, creeks and brooks are designated as Water Management Types I or II with the exception of those waters or portions thereof lying west of Vermont Route 22A south of Vergennes and those streams lying within Grand Isle County which are designated as Water Management Type III streams.

C. Interstate Waters:

The State's interstate waters are designated by Water Management Type as follows:

WATERS	SECTION	WATER MANAGEMENT TYPE
(a) LAKE CHAMPLAIN		
	South Bay to Crown Point	V
	Crown Point to Canadian Border where depths are less than 30'	V
	Crown Point to Canadian Border where depths are greater than 30'	IV

WATERS	SECTION	WATER MANAGEMENT TYPE
(b) MISSISQUOI RIVER, MAIN STREAM		
	Headwaters to Canadian Border Missisquoi River enters Canada	I
	Canadian Border as Missisquoi re-enters Vermont to Enosburg Falls	II
	Enosburg Falls to confluence with Lake Champlain	III
(c) POULTNEY RIVER		
	Headwaters to Carvers Falls	I
	Carvers Falls to confluence with Lake Champlain	III
(d) METTAWEE RIVER		
	Source to N.Y.-Vt. State Line	I
(e) INDIAN RIVER		
	Source to N.Y.-Vt. State Line	I
(f) BATTENKILL		
	Source to N.Y.-Vt. State Line	I
(g) CAMDEN CREEK		
	Source to N.Y.-Vt. State Line	I
(h) WHITE CREEK		
	Source to N.Y. - Vt. State Line	I
(i) WALLOOMSAC RIVER		
	Source to N.Y. -Vt. State Line	I
(j) HOOSIC RIVER		
	Mass.-Vt. State Line to Vt.-N.Y. State Line	III
	North Branch - Source to Mass-Vt. State Line	I
	Roaring Brook - Source to North Branch	I

WATERS	SECTION	WATER MANAGEMENT TYPE
(k) All other unlisted miscellaneous Vermont interstate streams which enter New York		
	Source to N.Y. -Vt. State Line	I
(l) CONNECTICUT RIVER, MAIN STREAM		
	Vt.-N.H. State Line to Nulhegan River	I
	Nulhegan River to Whetstone Brook	II
	Whetstone Brook to Mass.-Vt. State Line	III
(m) DEERFIELD RIVER, MAIN STREAM		
	Source to Vt.-Mass. State Line	I
(n) MISCELLANEOUS INTERNATIONAL STREAMS		
	Rock River - Source to Canadian Border	I
	Canadian Border to Lake Champlain	II
	Pike River - Source to Canadian Border	II
	Coaticook River - Source to Canadian Border	I
	Johns River - All Vermont portions	I
	Stearns Brook - Source to Canadian Border	I
	Holland Brook - Source to Canadian Border	I
	Averill Creek - Source to Canadian Border	I
	Tomifobia River - Canadian Border to Derby Line Sewage Treatment Plant	I
	Derby Line Sewage Treatment Plant to Canadian Border	II
	All other unlisted international streams - All Vermont portions	I
(o) LAKE MEMPHREMAGOG		
	All Vermont portions including South Bay	IV
(p) WALLACE POND		
	All Vermont portions	IV

RULE 7: Hydrology

Water quality classification standards and associated requirements shall apply in all instances except during periods when the low natural stream flow is less than the consecutive seven (7) day mean low flow

with a ten (10) year return period. On those rivers and streams whose rate of flow is artifically regulated, the flow shall not be reduced to a point where these standards and requirements governing water quality cannot be met nor shall such flow be regulated in such a way as to produce erosion or sedimentation with resulting discoloration or turbidity in excess of the limits provided in these regulations. The Secretary shall cooperate with appropriate federal, state, municipal and private interests in the development and maintenance of streamflow requirements.

This rule shall in no way be construed to permit less than the normal design operation of any wastewater treatment facility during periods of low stream flow or to otherwise waive any discharge prohibitions or restrictions.

RULE 8: Conditions of Natural Origin

The standards and requirements governing water quality set forth in these rules apply to all waters of the State except where conditions of natural origin prevent their attainment. Where such conditions prevent attainment of the requirements set forth in these regulations, no waste discharges, artificial flow regulation or other activities which would further reduce water quality or inhibit legitimate uses of such waters shall be allowed except as may be provided for through the classification process set forth in Chapter 47 of 10 V.S.A.

PART III DISCHARGES

RULE 9: Permit Required for Discharge of Wastes

As required by Section 1259 Title 10 V.S.A., no person shall discharge any waste, substance or material into waters of the State without first obtaining a permit for such discharge from the Secretary. These regulations shall not prohibit the proper application of fertilizer to fields or crops or reduce or affect the authority of policy declared in Joint House Resolution 7 of the 1971 session of the General Assembly.

RULE 10: Discharges Restricted - Class A Waters

There shall be no discharge of wastes to Class A waters that do not meet or exceed the technical and other requirements for such waters nor shall there be any discharge of wastes containing any form of nutrients which would encourage eutrophication or growth of weeds or algae.

Discharges of wastes of a domestic origin or of wastes which contain pathogenic organisms prior to treatment, shall not be permitted in Class A waters regardless of the degree of treatment provided.

RULE 11: Discharges Restricted - Class B Waters

There shall be no discharge of wastes to Class B waters that do not meet or exceed the technical and other requirements for such waters. Discharges of wastes of a domestic origin or of wastes which contain pathogenic organisms prior to treatment, shall not be permitted in Class B waters regardless of the degree of treatment provided.

There shall be no new or increased discharge of wastes after May 27, 1971 containing any form of nutrients which would encourage eutrophication or growth of weeds and algae in any lake, pond or reservoir. Any discharge of wastes existing prior to May 27, 1971 containing soluble or other nutrients which would encourage eutrophication or growth of weeds and algae in any lake, pond or reservoir shall receive the highest practical degree of treatment currently available to remove such nutrients.

RULE 12: Discharges Restricted - Upland Streams

Upland streams are those Class A or Class B rivers, streams brooks and creeks upstream of the most upstream discharge of wastes from an existing municipal wastewater treatment facility, or of a municipality or community discharging wastes requiring treatment in a manner to be approved by the Secretary, or upstream of such other point as may be determined after public hearing by the Water Resources Board to be in the public interest.

After December 20, 1973 there shall be no new or increased discharges to upland streams of any treated or untreated domestic, sanitary, commercial or industrial wastes, nor shall there be any new or increased discharge of any other wastes which would degrade in any respect the quality of the receiving waters. Where technically feasible, existing discharges of such wastes to upland streams shall be eliminated by utilizing offstream disposal techmiques.

Where offstream disposal of discharges to upland streams of treated or untreated domestic, sanitary, commercial or industrial wastes existing prior to December 20, 1973 is determined to be technically infeasible, the Secretary may impose requirements to reduce

the degradation of the receiving waters and grant temporary authorization to continue discharging such wastes in accordance with the provisions of Section 1265 10 V.S.A. provided that the Secretary thereafter recommends to the Board that the upland stream designation of the receiving waters be removed and that such waters be reclassified in accordance with the provisions of Section 1253 of Title 10 V.S.A. as necessary.

This rule shall not apply to the discharge of surface storm-water after treatment for removal of settleable and floatable materials, including grease and oil, and such other treatment as may be required by the Secretary to protect the quality of the receiving waters in accordance with applicable State statutes and these regulations.

RULE 13: Discharges with Chemicals and Radiological Constituents - Prohibited Substances

Wastes discharged to waters of the State shall contain no chemical or radiological constituents which would be inconsistent with the water uses associated with the assigned water class.

Discharge of radioactive material to waters of the State shall not exceed the lowest practicable limits after utilization of the latest technological development and equipment for control of radioactive emmissions. In no event shall the discharge of such materials exceed the limits established by the Agency of Human Services.

There shall be no discharge of wastes containing any of the prohibited substances set forth below in detectable amounts either to waters of the State or to a municipal wastewater collection and/or treatment facility except in those cases where a process water contains

an incoming level of a prohibited substance due to natural or other causes. In such cases the concentration of the prohibited substance or substances in the actual wastes discharged shall not be increased.

Prohibited Substances

2,4,5-T

Aldrin:

hexachlorohexahydro-endo
exo-dimethanonaphalene

DDT:

Dichlorodiphenyl trichloroethane
2,4,5-trichlorophenoxyacetic acid

Dieldrin:

hexachloxoepoxyoctahydro-endo
exodimethanonaphalene

Diquat:

diquat dibromide
6,7-dihydrodipyrido
dibromide
pyrayidiinuim

Endrin:

hexachloroepoxyoctahydro-endo
endodimethanonaphalene

Mercury

Polychlorinated biphenyls

Thallium

The Secretary shall determine in accordance with the provisions of Section 1259 of Title 10 V.S.A. the appropriate limits for discharges containing chemical and other substances when such limits are not otherwise specified by these regulations. In establishing such effluent limitations, the Secretary shall use the current edition of the United States Environmental Protection Agency publication Quality

Criteria for Water as a guideline and reference and shall give consideration to concentrations of prohibited substances and other constituents in the receiving waters and to any synergistic relationship which may exist between the various substances being discharged and those existing in the receiving waters.

RULE 14: Thermal Mixing Zones

As a requirement of any permit for the discharge of heated wastes to the waters of the State, the Secretary may designate a specific portion of the receiving waters as a thermal mixing zone. Thermal mixing zones shall be allowed only where the wastes otherwise conform with the technical and other requirements established for the receiving waters and shall be utilized solely for the dispersal and dilution of heated wastes which have been adequately treated in the judgment of the Secretary.

Thermal mixing zones shall be designated so as to not constitute a barrier to the passage or migration of fish or produce significant adverse effects on any fishery or other forms of wild or aquatic life. As a guideline, thermal mixing zones should be limited to no more than 25 percent of the cross-sectional area and/or volume of the receiving water.

RULE 15: Stormwater; Combined Sewers

After December 20, 1973, no drains, pipes, ditches or other conduits carrying rain or stormwater shall be connected to a wastewater treatment facility without prior approval of the Secretary. Such approval shall be based upon a determination by the Secretary that such a connection is consistent with an acceptable, comprehensive wastewater control program for the municipality.

Discharges of rain or stormwater created after December 20,1973 shall be treated as required by the Secretary to protect the quality of the receiving water and the classification assigned to it.

With respect to such pipes or other connections to waste treatment plants as are in existence on the date of the adoption of these rules, separation of the piping carrying such rain and stormwater from the piping carrying sewage, together with containment and/or treatment of the stormwater shall be made to the extent funds are available and as required by the Secretary.

PART IV PROCEDURE

RULE 16: Sampling and Analysis

All methods of sample collection, preservation, handling and analysis shall conform as closely as practicable to those methods contained in the latest edition of Standard Methods for the Examination of Water and Wastewaters, American Public Health Association, New York, N.Y., except that when applicable and approved by the Secretary those methods shall apply as contained in the latest editions of American Society of Testing and Materials Standards, Part 23, Water: Atmospheric Analysis, 1970, American Society of Testing and Materials, Philadelphia, Pa.; or Methods for Chemical Analysis of Water and Wastes, April 1971, EPA Water Quality Office Analytical Quality Control Laboratory, 1014 Broadway, Cincinnati, Ohio. Bioassay application factors used in establishing limits for toxic discharges which are not otherwise limited by these rules shall consider those recommendations contained in the U.S. Environmental Protection Agency publication Quality Criteria for Water July 1976 or successive publications.

RULE 17: Investigations, Studies, Scientific Research :

In order to provide for investigations, studies and scientific research necessary for the protection and management of the water resources of the State, the Board may authorize technical or incidential violations of these regulations in accordance with the following procedure

(1) Authorization shall be granted by the Secretary only for programs conducted or supervised by the Department of Water Resources, (hereinafter Department).

(2) In the case of investigative programs conducted by the Department, continuing authorization to make discharges which may result in technical or incidental violations of these regulations shall be granted only for determining whether a discharge exists or whether it is in violation of the statutes and rules. In such cases, the Secretary may authorize the Department to conduct on-going and routine investigations.

(3) Authorization shall be granted to conduct technical studies and scientific research related to the aquatic environment, where technical or incidental violations of the regulations may result, to determine the adequacy or propriety of an existing or proposed rule or to determine if proposed actions or discharges will be in conformance with these regulations where:

(a) the object of the study or research cannot readily be determined by any other method which does not involve a discharge into the waters of the State, and

(b) where such studies and research will not result in either a significant adverse effect on human health or an irreversible or significant adverse effect on the aquatic environment.

(4) Authorization shall be granted only for the period of time necessary to conduct the investigation, research or study, which shall be specified in any authorization granted.

(5) Application for authorization to conduct such investigations, studies and research shall be made to the Secretary, and shall include a detailed description of the project, a statement of the reason for the project, an explanation of why the project objectives cannot be obtained through other methods, an analysis of the likely effects the project will have on human health or on the aquatic environment, which rule may be violated by the project, what the extent of the violation will be, and such other information as the Secretary may need in determining whether ot authorize the project.

(6) In all projects involving aquatic technical studies and scientific research, the Department shall advise the Departments of Fish and Game, and Forests, Parks and Recreation, which Departments shall comment on the project. Such comments shall be submitted to the Secretary with the application and shall be considered by him in determining whether to authorize the project. The Department shall also advise any States affected by projects involving interstate waters.

(7) Authorization of said project by the Secretary shall take effect only after filing of the proposal for ten (10) full working days with the Board during which time the Board may take action to disapprove the Secretary's authorization or take such other action as the Board may deem necessary. If, during the ten (10) day filing period, no action is taken by the Board, the Secretary's authorization shall stand.

(8) The application, the action taken thereon and the results of any investigative or study programs authorized pursuant to this rule, shall be placed on record in a central file in the Department of Water Resources and made available during normal working hours for review by the public.

Rule 18. Appeals to the Board

Any person or party in interest aggrieved by an act or decision of the Secretary pursuant to these regulations may appeal such act or decision to the Board within thirty (30) days from the date thereof. The Board shall hold a hearing, at which all persons and parties in interest may appear and be heard and shall issue its order affirming, reversing or modifying the act or decisions of the Secretary. Such order shall be binding upon the Secretary.

An appeal filed pursuant to this rule shall not stay the effectiveness of any act or decision of the Secretary pending determination by the Board.

Adopted this 1st day of March, 1978

VERMONT WATER RESOURCES BOARD

Frederick G. Mehlman, Chairman

Roderic J. Maynes, Member

Ruth Poger, Member

ENERAL

GREGORY A. MCKENZIE
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STATE OF VERMONT
OFFICE OF THE ATTORNEY GENERAL
109 STATE STREET
MONTPELIER
05602
TEL. 802-828-3171

February 23, 1979

Reginald LaRosa,
Commissioner
Department of Water Resources
Montpelier, Vermont 05602

Dear Tex,

Attached is my legal analysis of some of the legal issues that concern possible conflicts between water quality and water quantity under state and federal regulatory authority. This work grows out of requests from your staff relating to the wasteload allocation process late last spring. The requests came from Richard Czaplinski, Gary Schultz and Thomas Willard.

Since the area is relatively new and the issues complex, I have sought to be as comprehensive as possible. But, on the other hand, we have kept the format to that of an exploratory analysis, and in no sense is this paper an Attorney General's Opinion. Our main goal is to aid your department and interested members of the public in analyzing and discussing the problem.

I want to mention that I am greatly indebted to Edward I. Selig, Esq. of Boston who was of immense help and who brought some of his expertise to bear, as he has worked on the same topic for USEPA.

Let me know if I can be of further help.

Sincerely,

Benson Scotch
Assistant Attorney General

BS/chs

Enclosure

WATER QUALITY AND WATER QUANTITY IN VERMONT: A LEGAL ANALYSIS

February 26, 1979

Benson D. Scotch
Assistant Attorney General

I.

The national concern for renewable energy resources is mirrored strongly in Vermont, a State highly dependent upon oil for heating and electrical generation and a State where controversy over nuclear power has deeply divided its citizens. The renewed interest in hydroelectric power has raised some environmental issues only dimly understood prior to the passage of the Water Pollution Control Amendments of 1972 (P.L. 92-500). The most critical of these issues in Vermont is the conflict between the need for stream flow volume adequate to assure water quality given the levels of wastewater discharged and the need for management of stream flows by the hydroelectric users to maximize power output, including storage and release strategies that could reduce minimum instream flows to levels inadequate for water quality maintenance purposes.

Efforts to maintain the water quality of Vermont's lakes and streams have been the active concern of the Vermont Legislature since at least the 1960's[1/] The State's modernization of its water pollution laws in many respects preceded Congress' own 1972 Federal Water Pollution Contral Act amendments (P.L. 92-500)("FWPCA"). Yet neither the State nor the federal water pollution control legislation considered hydroelectric facilities either as sources of discharges or as obstacles to sound water management.

The conflict is not a struggle between polluters and conservationists, but rather a conflict between two environmentally

conscious users of our water resources--water pollution control interests and the developers of an electric power source widely acclaimed as one of man's "cleanest" energy sources.

The Winooski River offers an interesting case example of how the water quality-water quantity dilemma has evolved and how government, utility, and citizen concerns interact.

The Winooski[2/] flows from sources in the northeast quadrant of Vermont and is a principal tributary of Lake Champlain, the State's largest lake and an important part of its economy and its cultural and environmental heritage.

The Winooski itself has been an important waterway for the towns on its banks. Fishing and recreation on the Winooski and its seven major tributaries have been integral to the tourist industry in the area; seven cities and towns in the lower portion depend on the same basin system for disposing of municipal storm-water and wastewater; and the Green Mountain Power Company has two hydroelectric facilities on the Lower Winooski, one known as No. 19 dam at Essex, some 18 miles from the mouth, and another, known as the Gorge Dam at Winooski, some 11 miles from the mouth. Another hydroelectric facility is proposed (Chase Mills).

The principal difficulty experienced in reconciling the interests of water quality on the Winooski with the economic operation of the Green Mountain Power facilities has been the utility's practice of restricting stream flow during certain periods in its operating cycle. Particularly in the summer months, when natural flows are usually diminished, there have been times when the discharges to the river have exceeded its assimilative capacity, with resultant degradation in water qualit

II.

The two principal agencies of government involved with the problem are the Agency of Environmental Conservation[3] ("the Agen and the Public Service Board[4] ("the PSB").

The Agency and PSB are independent units in the overall structure of Vermont government. Neither reviews the decisions of the other, and there is no provision in State law for joint management or common jurisdiction.

The Secretary of the Agency administers the principal water pollution control program, the National Pollution Discharg Elimination System ("NPDES") under the FWPCA and has authority to enforce the Act against violators.[5] The Department of Water Resources is a unit of the Agency, and the water quality divisior is a unit of the department.

The Secretary's decisions on discharge or temporary pollution permits are appealable to the Water Resources Board[6] and thereafter the State Superior Court.[7]

The Water Resources Board, as a body legally independent of the Secretary, also issues orders classifying State waters accord ing to use[8] and adopts certain State regulations,[9] such as the Vermont Water Quality Standards.

The Public Service Board is generally responsible for over- seeing Vermont's public utilities. It presently combines plannin regulatory and quasi-judicial functions, although the State Legis lature has recently debated separating functions into at least two independent entities.[10] The principal types of cases to come before the PSB are utility rate matters[11] and petitions to construc electric generation facilities.[12]

Appeals from Public Service Board decisions are to the Vermont Supreme Court.[13]

Hydroelectric facilities are also licensed by the Federal Energy Regulatory Commission, formerly the Federal Power Commission, under the Federal Power Act. On matters within the Federal Power Act, Federal Energy Regulatory Commission decisions are binding upon the states.[14/]

III.

The problem of maintaining sufficient minimum instream flows on the Winooski to assure water quality has never been specifically addressed or solved in Vermont, either by the Agency of Environmental Conservation, the Public Service Board, the Federal Energy Regulatory Commission, the affected municipalities, or the utility itself. The problem remains unsolved today, in the face of ever-increasing pollution wasteloads on the one hand and the rising cost of electrical power on the other with resulting demand that flows be fully devoted to hydro generation.

The major reasons for the absence of a solution are institutional: the state agencies involved are task-oriented, and none of the State enabling legislation has linked water quality and quantity problems within the same program or required meaningful cooperation between environmental and utilities programs. Secondly, there has been relatively little information available on the scope of the problem and the best strategy for dealing with it while minimizing the total social costs, which include at least the costs of lost power generation, additional abatement facilities or equipment and diminished scenic and recreational opportunities.

But since 1972 the State has, in the process of fulfilling both FWPCA and analogous state law, been filling in the gaps, both institutional and informational. The main institutional change has been the increasing role of the Agency of Environmental Conservation, acting to fulfill the federal-state water planning mandates.

The FWPCA provided for state planning as well as permit programs.[15] Vermont law, in response to §303(e) of the Act, mandated a continuing planning process, and in 1976 the Winooski River Basin Water Quality Management Plan ("WQMP" was adopted by the the Agency of Environmental Conservation pursuant to the State's Administrative Procedures Act.[16]

The Winooski River Basin Water Quality Management Plan (WQMP) helped in several ways to bring the quality/quantity issues on the Winooski into focus. The Plan established that maintenance in the Winooski of sufficient dissolved oxygen ("DO")--a critical measure of water quality under Vermont Water Quality Standards--could not be assumed under all conditions due to inadequate treatment of existing sewage discharges. It provisionally allocated discharge rights (or "wasteload allocations to wastewater treatment facilities at Essex Junction, Essex Town, Williston, South Burlington, Burlington (Riverside and North End), Winooski, Colchester and the IBM plant at Essex Junction.[17]

These wasteload allocations[18] were rudimentary and temporary. They simply set uniform maximum limits on effluent concentrations at discharge points but did not purport to guarantee that

total flows of effluent from all sources would not exceed the Winooski's ability to assimilate them.

Under the State's continuing planning process permanent wasteload allocations must be determined.[19/] The permanent allocations will set the total flow of effluents from each discharge point, taking into account (a) the needs of each locality, as determined by public meetings and hearings in the immediate area; and (b) the assimilative capacity of the Lower Winooski at various locations based on careful field data and stream flow modeling techniques.

The assimilative capacity of a stream is directly related to the dissolved oxygen in the water, and the major determinants of DO are the volume and speed of a river's flow. It follows that any wasteload allocation must be based upon some assumption concerning minimum stream flow. If planners assume a minimum flow that is unrealistically high they will authorize discharges which are likely to overtax the river during low-flow periods. An unrealistically low minimum stream flow assumption will tend to underestimate wasteload carrying capacity and restrict discharg unnecessarily.

Planners have determined that the most practical standard for establishing what a river's minimum flow will be is "the lowest natural mean flow likely to occur in a given stream in any seven-day period, once during a ten-year period." For short, this minimum standard is called "7Q10 flow."[20/]

It should be stressed that water quality standards do not vary with the increases or decreases in stream flow: the quality of the water must meet or exceed the standard during all seasons of the year, whenever natural stream flow is above the 7Q10 flow.

The Lower Winooski to date has not consistently met the water quality standards. The WQMP points out that when each of the seven existing and proposed waste treatment facilities on the river is operating at design capacity, over 10,000 lbs/day of ultimate oxygen demand ("UOD")[21/] will be discharged to the Lower Winooski. This is about four times the amount of UOD the Winooski can absorb when the river is flowing at the lowest rate planners now project (about 2500 lbs/day at flows of 146 cubic feet/second.

In addition to already existing water quality problems, in recent years water quality problems arising in part from the impounding practices of the Green Mountain Power dams in the Lower Winooski River have been experienced.[22/] The No. 19 dam periodically restricts river flow to approximately one-half of the 7Q10 (minimum) flow specified in the WQMP.

Presently the communities on the Lower Winooski are at various stages in the design state for upgrading their waste treatment facilities, and all of the respective design flows are based upon 7Q10 standards, not the much lower existing flow conditions.

The result of this disparity has led the Vermont Department of Water Resources to predict further violations of water quality standards by the 1980's, even assuming the upgrading of the treatment facilities.

The problem was noted by Vermont's water resources staff at least a decade ago.[23/] A 1968 report cited in the WQMP recommended:

"In order to maintain the recommended classification, the Green Mountain Power Company's Hydro-electric generating stations at Essex Junction and Winooski Gorge should be operated so as to provide a minimum continuous flow of 120 cfs in the Winooski River below these dams whenever the natural flow in the river would equal or exceed this value. When the minimum natural flow is less than 120 cfs the release from the dams should equal the natural flow."

The order classifying the Winooski finally issued on June 9, 1969[24/] did not mandate minimum flows, as there was no statutory authority to do so under state laws. And no clear authority exists today.

IV.

Solutions for the projected disparity between water quality standards on the Lower Winooski and the projected wasteload from the seven major dischargers identified in the WQMP were proposed in the WQMP[25/] and, since its promulgation, in various contexts within the Agency.

Overriding any specific strategies to solve the water quality-quantity conundrum is the need for advanced waste treatment facilities to solve already existing pollution problems for each of the seven principal point source discharges. Since point-source effluent limits are based upon assumptions about the minimum (7Q10) flow, these limits will be totally inadequate protection for the Winooski's water quality if these flows are not realized in fact. Lower-than-7Q10 flows are obviously

beyond the power of any wastewater discharger to control, and the resultant facilities planning may well result in violations of water quality standards, though the planning itself is not legally substandard.

The first possible solution uniquely aimed at low-flow related water quality problems is to develop strategies applicable during critical low-flow periods. If it is technically and economically feasible for treatment plants to be operated to finer tolerances during periods of low flow, clearly the conflict potential is minimized.

Another strategy, not dependent upon being able to periodically improve the performance of the treatment plant, is to store effluent on a seasonal basis with release as needed to maintain water quality standards during 7Q10 or lower flow conditions. The potential cost of effluent storage capacity for each facility is obvious, and to the knowledge of the Water Resources Department designers have not given serious consideration to this alternative.

A variant of this proposal is land disposal of effluent during the summer months in at least some of the sewage treatment plant areas.

Another possible alternative solution is to relax water quality standards, at least on a seasonal basis. It is doubtful as a matter of policy, and perhaps as a matter of federal law under the FWPCA, that violation of existing water quality standards because of artificial interruption of flow in a river segment which already suffers from excess pollution can be "remedied" by lowering the water quality goals.

Relaxation of State water quality standards is permitted only under narrowly defined circumstances. 40 CFR §130.17(c) provides:

> "(c) In reviewing and revising its water quality standards pursuant to §130.17(a), the State shall adhere the following principles:
>
> * * *
>
> (3) At a minimum, the State shall maintain those water uses which are currently designated in water quality standards, effective as of the date of these regulations or as subsequently modified in accordance with §130.17(c)(1) and (2). The State may establish less restrictive uses than those contained in existing water quality standards, however, only where the State can demonstrate that:

(i) The existing designated use is not attainable because of natural background;

(ii) The existing designated use is not attainable because of irretrievable man-induced conditions; or

(iii) Application of effluent limitations for existing sources more stringent than those required pursuant to section 301(b)(2)(A) and (B) of the Act in order to attain the existing designated use would result in substantial and widespread adverse economic and social impact."

Only subparagraphs (ii) or (iii) could be argued in support of lower water quality standards, but neither section is likely to prevail as support for lowering standards. Hydroelectric facilities are very unlikely to qualify as "irretrievable manmade condition[s]": under (ii) since flow rates are adjustable. And while some economic impact will be experienced if the Green Mountain Power dam is not permitted to restrict flow in a manner designed to optimize power production, it appears very unlikely in the context of §303(e) of the FWPCA that such economic impact would easily meet the test in (iii) of "substantial and widespread adverse economic and social impact."[26/]

Another avenue open to the Agency under State environmental laws is to enforce the requirements of the National Pollution Discharge Elimination System against Green Mountain Power on the theory that hydroelectric dams that artifically restrict flow create a "discharge" into the waters of the State. Discharges require an NPDES permit under the FWPCA. Vermont administers the NPDES program.

The theory underlying such an action was recently upheld by the U.S. District Court in South Carolina in South Carolina Wildlife Federation v. Alexander, 11 ERC 2045 (D.S. Car. July 27, 1978). This action was a citizens' suit under the FWPCA to stop the construction and potential operation of one dam and the continued operation of others, all upon the theory that these hydroelectric facilities were or would be discharging pollutants into navigable waters. One of the pollutants cited was oxygen-deficient water emanating from the dams. The plaintiffs in S.C. Wildlife Federation also raised an issue of increased concentrations of various minerals, an issue beyond the scope of our present concern.

The defendants sought to dismiss the action for failure to state a legal claim, and the court ruling was limited to the motion, not dealing with the merits of the claim that water impounded by a hydrodam was, in fact, oxygen deficient.

The Court concluded that oxygen-deficient water was a pollutant. It said:

> "In this case, high quality water--high in dissolved oxygen and low in metals--will enter the facility and low quality water with added pollutants will be discharged. Thus, the release of the water as changed because of the impoundment constitutes the 'addition' of pollutants into a navigable water. If unpolluted water entered the reservoir and was then held in the reservoir in a manner resulting in stagnation, and the water was then released back into the Savannah River, though defendants may not have added the first particle to the water in the reservoir, they would have unquestionably caused the addition of pollutants into a navigable water. . . ."

If upheld and followed, the S.C. Wildlife Federation case could provide the State with sustainable power to deal with the quality/quantity issue. While the case only dealt with the oxygen content of the impounded water and not the rate of flow, the power to mandate normal oxygen content could result in an agreement on minimum instream flow rates, particularly if the cost of constructing and operating aeration equipment exceeded the value of power lost by maintaining minimum instream flows.

But it must be concluded that it is much too early to foresee the final outcome of initiatives under the FWPCA like that in the S.C. Wildlife Federation case or weigh their impact on Lower Winooski problems.

The last and perhaps most significant alternative from the State's point of view would be to order the hydroelectric facilities on the Lower Winooski to maintain flows at least equal to 7Q10 flows at all times instead of storing water and releasing it to maximize peak power output. Until the stream modeling results are completed, it is impossible to forecast the precise degree to which the problem of water quality during low stream flows will be ameloriated by ordering maintenance of minimum stream flows at such times.[27/]

But it appears from present existing data and the Agency's experience that maintenance of 7Q10 flows would be effective and relatively simple to monitor. The Agency is far less certain of the authority to issue such an order.

reviews and considerable local input.[31] It is likely, if the public participation process succeeds, that a knowledgeable public opinion will develop on the quantity/quality issue as a result of the process of arriving at permanent wasteload allocations.

The unswerving assumption of the Department of Water Resources is that 7Q10 flows, and no lesser flows, will be used in determining permanent wasteload allocations. Rule 7 of the Vermont Water Quality Standards in fact leaves no other alternatives.[31]

Agency policy pronouncements about permanent wasteload allocations have also rested on the assumption that minimum in-stream flows will be maintained at 7Q10 levels. The Agency of Environmental Conservation has adopted a Lower Winooski Treatment Policy[32] which thoroughly assesses State policy on implementation of the temporary wasteload allocations and acts as a bridge between the 1976 Water Quality Management plan and the future permanent wasteload allocations.

Four integral steps are stated in the draft Treatment Policy as necessary to meet water quality standards or minimize violation into the early 1980's:

> "1. Construction of basic secondary wastewater treatment facilities capable of phosphorus removal and effluent filtration for all municipal discharges on the Lower Winooski.
>
> 2. Treatment equivalent to municipal wastewater treatment facilities for all industrial discharges and/or optimization of existing treatment.

3. Operation of all wastewater treatment facilities to optimize summertime nitrification.

4. Operation of hydro-electric facilities to pass 7Q10 flows or to pass natural river flows if flow falls below 7Q10."

The current planning for basic secondary wastewater treatment facilities assumes a level of treatment based upon 7Q10 flows. It is evident to the Agency that if 7Q10 flows are not maintained, higher levels of treatment will be necessary to maintain the same water quality standards.

While the issue has never been articulated publicly in such terms, the relationship of the low-flow policy of the hydroelectric facilities on the Lower Winooski to the acceptability to each locality of the nonuniform, permanent waste allocations for their treatment facilities could be critical.

Permanent wasteload allocations will be adopted by the Secretary of the Agency as rules under the Vermont Administrative Procedures Act. Formal rulemaking hearings will be preceded by a series of informational hearings, both conducted by the Agency. The APA permits participation by interested persons in the adoption process and provides for a court determination of the validity of rules promulgated.

The issues in the adoption hearing will be the sufficiency of the wasteload allocation for a given locality and the implications of the allocation on the growth potential for the locality and the possible impact on the design and cost of advanced wastewater treatment plants needed to meet water quality standards in light of the permanent allocation.

A less obvious but distinctly possible issue might be the instream flow rate associated with a proposed allocation. Success by the Agency in enforcing 7Q10 flows will tend to support arguments for greater allocations but will tend to increase the cost of electric power, if we assume that limiting the hydroelectric dams' ability to restrict flows will reduce the power produced or increase its cost.

Preliminary studies have been done by the Agency concerning flow augmentation above 7Q10 flows as an alternative to advanced waste treatment.[33/] The cost of flow augmentation to the utility is lessened efficiency and higher potential costs to customers. The benefit to municipalities is that treatment facilities will be less expensive. The capital costs of upgrading treatment facilities along the Lower Winooski as an alternative to altering the flow policies of the No. 19 dam to assure 7Q10 flows will be hard to estimate until final designs near completion, but it appears quite certain that it would cost more (1) to attain a very great degree of treatment without any loss of power generation, than (2) to hold constant the degree of treatment at a somewhat lower level, sacrifice some power generation by releasing flows for water quality, and purchase make-up power at higher prices from alternative sources.

The Agency firmly believes that the same survey supports the conclusion that bringing minimum stream flows up to 7Q10 standards where presently below 7Q10 will cost utilities (and their ratepayers) less in lost electric generation than the annualized cost of upgrading treatment systems to meet water quality standar

where lower than 7Q10 flows are postulated.

But while increasing minimum instream flows to 7Q10 levels may result in a net overall social benefit, the benefit does not fall evenly on all members of the community.

The power generated by the No. 19 dam flows into the Green Mountain power grid, and the cost of power to replace that lost by maintaining minimum stream flows would be passed on to all of Green Mountain Power's customers, only a fraction of whom are taxpayers in the municipalities whose treatment plants discharge into the Lower Winooski. If 7Q10 flows are not maintained and either smaller wasteload allocations are proposed, upgraded treatment facilities built, or other strategies such as effluent storage and programmed release or land disposal, are mandated to maintain water quality during low-flow conditions, certain additional costs would be borne by the municipalities or businesses operating the facilities. Green Mountain ratepayers could be expected to evince far more interest in any strategy that permitted the electric utility to maintain optimal power output at all times, and this policy will certainly be reflected generally in the goals of both federal and state energy policies, although no federal or state agency has taken a stand on the precise question of instream management.

It should be pointed out that the informational and administrative procedure hearings held prior to the adoption of the permanent wasteload allocations will be conducted under procedures calculated to involve members of the communities whose discharge facilities will be affected, rather than all customers

of the Green Mountain Power. It will be difficult for a local taxpayer to look beyond the threat of higher property taxes to support an advanced waste treatment plant and equally difficult for an electric ratepayer to look beyond higher electric rates to help ease pollution control problems in someone else's town.

It is extremely doubtful that the appeal by a town or its residents of any wasteload allocation to the Water Resources Boa or the Superior Court would serve as a forum to raise the issue of the failure of Green Mountain Power to maintain minimum in-stream flows or resolve fundamental differences between town residents and Green Mountain Power ratepayers. First, Green Mountain Power would not be expected to be a party to such an appeal. Secondly, the issues in the wasteload allocation proces do not relate to allocations that might result if less-than 7Q10 assumptions were made.

In summary, the process of adopting permanent wasteload allocations for discharges on the Lower Winooski will be likely to bring quantity/quality issues on the Lower Winooski into sharper public focus but will not necessarily offer the means to enforce each of the solutions described above.

(B) State Utilities Regulation

The second area of potential State authority to deal with the water quality/quantity issue in Vermont is the area of utilities regulation. But the State regulatory agency, the Public Service Board, operates with the same institutional deficiency as the Agency of Environmental Conservation: Lack of specific authority to deal with the problem.

The Vermont Public Service Board has taken the position that any new hydroelectric facility, even though federally regulated, is subject to the provisions of Vermont law[34/] which provides for the issuance of a certificate of public good. As part of the conditions for the issuance of a certificate of public good, the Public Service Board must find that the proposed construction:

> "(1) will not unduly interfere with the orderly development of the region with due consideration having been given to the recommendations of the municipal and regional planning commissions and the municipal legislative bodies;
>
> * * *
>
> (4) will not have an undue adverse effect on esthetics, historic sites, air and water purity, the natural environment and the public health and safety."(Emphasis added)

The water purity criterion (unlike the language of the State Water Pollution Control Act) does not require a "discharge" in order to be applicable to a condition resulting in a water quality impairment. There appears to be little question from the text of §248 that the maintenance of minimum instream flows would be a valid subject for consideration at a §248 hearing.

The Agency of Environmental Conservation, in connection with the Chace Mills Project, a proposed hydroelectric facility at Winooski near the mouth of the Winooski River which is a joint venture of Green Mountain Power and the Burlington Electric Light Department, has already undertaken steps to raise quality/quantity issues in the §248 hearing. It is premature to evaluate what the role of the water quality issue will be in the Chace Mills license.

Even more open at this point is the role of any determination by the Public Service Board on the FERC operating license which must be obtained from the federal government for Chace Mills.

There will be a strong public policy interest in all sides in this matter to come to an accommodation on minimum stream flow and thereby to avoid the possibility that a FERC license might be issued overruling a state permit which protected 7Q10 flows. Public concern over environmental hazards in Vermont has been historically greater than in many other parts of the country, at least as measured by the degree of public participation and involvement in legislation, rulemaking and contested permit proceedings for developments or subdivisions requiring an environmental permit.

But public involvement in the rate regulation process and general concern about the cost of electric power has also been great in Vermont. Therefore, while peaceable accommodation of competing power and environmental interests is a distinct possibility, it should not be regarded as a guaranteed outcome either in the Chace Mills project or in any other future hydroelectric project in Vermont.

It should be stressed that the §248 process applies only to proposed <u>new</u> utility construction. It has no applicability to existing facilities. The Public Service Board under 30 V.S.A. §209 does have ongoing jurisdiction in all matters respecting "the manner of operation and conducting any business subject to supervision under this chapter, so as to be reasonable and expedient, and to promote the safety, convenience and accommodation of the public; . . . ."

The words of the section appear promising because stream flow regulation might arguably fall within the definition of "manner of operation . . ." But while the precise issue has never been litigated, the decided Vermont cases under this section (and a related section, 30 V.S.A. §208) make clear that only disputes between the utility and its customers are intended to be covered, not complaints against utility policy or practices affecting other interests.[35]

Finally, the Public Service Board has jurisdiction in addition to that in 30 V.S.A. §248 over the construction, alteration or removal of dams and projects that "relate to or are incident to the generation of electric energy for public use or as part of a public utility system, ..."[36]

This jurisdiction is potentially meaningful under language added in 1976 because it arises under the State's environmental laws, and in considering the "public good" under this additional jurisdiction Public Service Board must give "due consideration to the effect of such proposed project upon scenic and recreational values, upon fish and wildlife . . . upon the natural rate of flow of the water and the water quality in the stream, upon the existing uses of the water by the public for boating, fishing, bathing and other recreational uses and whether hazards to navigation, fishing, bathing, and other public uses are created . . . ."[37] (Emphasis added). The Agency of Environmental Conservation is responsible for investigating the effects of any project on fish and wildlife and certifying the results to the Public Service Board.[38] (But the Agency has no mandated role on the

issue of the natural rate of flow and water quality in the stream.[39])

The statute does not appear to cover dams licensed before 1976 or operate at all except in the instance of a petition to construct, remove or alter a dam.[40] Therefore, the additional Public Service Board jurisdiction does not provide the potential for a solution to the problem.

Moreover, as discussed below, the authority of the Public Service Board is subject to the supervening authority of the Federal Energy Regulatory Commission, which may or may not see the issue of public good in the same manner as the Public Service Board.

(C) FERC Jurisdiction

The Federal Energy Regulatory Commission ("FERC") has the primary authority to license hydroelectric facilities in the United States. But the FERC license to Green Mountain Power for the No. 19 dam does not require that effective minimum stream flows be maintained, though it may create a useful forum for a possible solution to the problem.

Prior to the issuance of the FERC (then the Federal Power Commission) license in 1969, the Department of the Interior reported on the No. 19 dam application, and the Department's Federal Water Pollution Control Administration advised that a license should provide for a "minimum flow to be derived from further study by the appropriate state agency or the Federal Water Pollution Control Administration, and this is provided for by Article 13 of the attached form." But the license does not specifically so provide.

However, Article 13 of the license Form L10 retains on behalf of the United States the right to use water for navigation purpose in a manner to be determined by the Secretary of the Army. The Commission retains jurisdiction on the issues of "life, health and property, and the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes . . . ."

The Secretary of the Army and the Commission retain authority over the release of water from the reservoir in the interest of their respective jurisdictions under Article 13.

The reservation of jurisdiction by FERC in Article 13 of Form L10 might well raise the possibility of a reassertion of FERC jurisdiction on the minimum flow issue, even though reopening licenses is not a routine procedure during a license term.

The reassertion of jurisdiction could be triggered by State action. Under State law and policy the Water Resources Board serves as the State's agent in coordinating the State's interest before FERC[41/] in all matters involving regulation or control of natural stream flow through the use of dams situated on streams within the boundaries of the State. Part of this duty is to advise FERC of the amount of flow considered necessary in each stream where a hydroelectric plant is considered, after consultation and review by an interagency committee on natural resources. The role of the Water Resources Board, however, is strictly advisory.

The powers retained by FERC are clearly adequate to suppo the issuance of an order by that commission to Green Mountain Power concerning minimum stream flows, particularly in light of the statement to the Federal Power Commission by the Federa Water Pollution Control Administration concerning "a minimum flow to be derived from further study by the appropriate State agency or the Federal Water Pollution Control Administration . . . .", as recited on p. 1 of the licensing order of January 21, 1969.

Article 13 of Form L10 itself arguably contains language that would support a minimum flow requirement by the FERC, since the instream flows relate strongly to "the protection of life, health and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes . . . ."

The authority may be perfectly clear, but FERC can hardly be held accountable if it pleads that its duty under such language is unclear. Its mission is to promote the orderly and coordinate development of water and other natural resources.[42] Though all federal agencies are bound to consider major actions significantly affecting the environment under the National Environmental Policy Act of 1969,[43] the NEPA mandate does not require FERC to examine licenses previously issued and not yet expired for compliance with environmentally sensitive permit conditions.[44]

More to the heart of the problem, even if FERC were to exercise the power reserved in its license and reexamine a licensee's minimum stream flow practices, it may be difficult for FERC to reconcile that task with its principal institutional mission of fostering power generation, even with staff and advisory assistance from the State, United States Environmental Protection Agency and the citizens' groups likely to take an interest in such proceedings. FERC has no formal presence on such bodies as the Water Resources Council[45] or the New England River Basins Commission. While informal contacts between FERC staff members and state and federal environmental staff are considerable the absence of institutional ties may help perpetuate a sense of isolation on issues where energy promotion and the environment appear in conflict.

Despite the existing authority of the FERC, there appear to be no precedents in the Northeast for setting minimum low flows below hydrofacilities in order to maintain water quality standards.[46]

State initiatives to order the maintenance of minimum stream flows without the cooperation of FERC will confront the long and well-settled principle of federal preemption. Both State and federal courts have long held that FERC authority over matters within the Federal Power Act[47]--and the manner and level of operation of a hydro-plant is classically within the FERC domain--preempts conflicting state attempts to exercise authority.[48]

However, where violations of the Federal Water Pollution Control Act are the basis for State action, the basis for FERC preemption is narrowed and possibly eliminated.

As for voluntary initiatives, there have been direct contacts between State personnel and Green Mountain Power concerning assimilative capacity problems on the Lower Winooski. In December, 1977 [49] Water Quality Division officials explained the State's position that it was necessary to maintain 7Q10 flows from any hydroelectric facilities existing or proposed on the Lower Winooski, since waste treatment facilities were designed to meet water quality standards at 7Q10 flows in this water quality limited segment.

Green Mountain Power proposed a plan by which it could generate at 1500 cfs for the first portion of each hour and then impound for the remainder of the hour so that the hourly average could meet or exceed the 7Q10 flow. The cycle period could be greater than one hour and the cycle would continue for 24 hours of each day.

The Water Quality Division also discussed the option of providing a basin-wide management scheme for flow augmentation. The Waterbury Reservoir, a 1,525,000,000 cubic foot (maximum) impoundment some 40 miles upstream from the No. 19 dam, could store a volume of water sufficient to augment flow during low-flow periods in the summer. The Department expressed the concern that this alternative would require considerable additional planning.

Following the adoption of the Vermont Water Quality Standard (see p. 6-7 supra) a Green Mountain Power official[50] wrote the Agency Secretary objecting to the requirement in the Vermont Water Quality Standards "which established that a minimum flow of 146 cfs will be required continuously in the river to maintain the river quality." The letter added, "We wish to raise an objection to the establishment of a minimum flow on a permanent basis. Our reason is that we would lose generating capability, resulting in substantially increased replacement power cost." It said that the company was obligated by the FERC to "optimize power output."

The Agency replied to Green Mountain Power on April 14[51], 1978 that Rule 7 of the regulations required that water quality standards be maintained in all cases except during periods when the low natural stream flow is less than the 7Q10 flow. The letter added, "Without a continous flow of 146 cfs water quality standards may be violated any time of the year." For legal authority the Secretary cited Article 13 of Form L10, referred to above.

Nevertheless, it is clear from the text of Article 13, as discussed earlier, that its terms are not self-executing and that for the position of the State to become effective, further State or federal action would be required, for example an order by the FERC. No petition has been filed seeking such an order as of the end of August, 1978 by any State or local authority or citizens' group.

CONCLUSION

The goal of developing Vermont's hydroelectric potential conflicts with the need to maintain minimum instream flows to serve wastewater treatment plants along the same streams. The towns and cities on the Lower Winooski are basing their plans for advanced waste treatment plants on maintenance of minimum instream flows by Green Mountain Power, which operates two hydro facilities on the river. Green Mountain Power requires some impoundment and release strategies to maximize economic electrical output.

To date neither State nor federal law has provided a clear forum for presenting and settling the quantity/quality conflict. The need for an approach to settlement increases as facilities planning progresses and as the State prepares to allocate effluent discharge maximums to municipalities along the Lower Winooski.

Litigation to settle the conflict under the Federal Water Pollution Control Act would be possible, but the outcome is not clear and at best the process would be a long one.

The Federal Energy Regulatory Commission, whose powers preempt Vermont's on questions of hydro-plant operation, could exercise its powers to enforce Green Mountain Power license conditions and set minimum instream flows. But FERC's primary mission is to promote efficient energy production, and there may be practical, institutional barriers to pursuing this option. The State and citizen groups can assert a strong interest in any new FERC licensing proceedings.

Because of the conflict between two laudable goals--energy production and water quality--and the lack of a clear set of standards or procedures, further direction from Congress might be the fairest and most expeditious path to resolution.

RECOMMENDATIONS

The balancing of the interests of water quality and hydroelectric generation in the Lower Winooski River should be achiev both as to existing and proposed facilities. Neither state nor federal environmental or utilities laws deal expressly with the process by which the compromise should be achieved.

Until Congress or the courts have established a clearer procedural path, Vermont's course is to pursue a solution under existing authority.

(1) As to the No. 19 Dam at Essex, one acceptable approach would be to open informal discussions among the Agency of Environmental Conservation, the Public Service Board, municipal representatives and Green Mountain Power. It is possible that a draft agreement on minimum stream flows could be reached. Any resulting accord would be subject to possible formal review by the PSB or FERC, and a formal license amendment should not be ruled out following review if power generation is affected. Any accord would have to take into account the independence of the administrative hearing process governing adoption of permanent wasteload allocations, for which maximum effective public participation should be assured.

(2) Should the process of agreement not resolve problems involving the No. 19 dam, the State, affected municipalities or citizens groups could consider administrative solutions under present law, such as petitioning FERC for appropriate relief, in the form of a license amendment. Such hearings are bound to be

time-consuming and will surely raise yet-unsettled questions of the applicability of the FWPCA to FERC proceedings where no discharge is at issue.

(3) In accordance with the doctrine announced in the South Carolina case (discussed above at pp.12-13), the Agency might issue an NPDES permit to Green Mountain Power for its No. 19 dam, including minimum release rates to sustain dissolved oxygen below the dam. If Green Mountain Power challenged this condition on the ground that its FERC license was preemptive and required a fixed level of power generation, the State could argue that the issue is not federal preemption of state law, but how to accommodate two federal laws: the Power Act, under which the license was issued, and the FWPCA, under which the NPDES permit was issued.

(4) As to new facilities, the State, affected municipalities or citizens groups could plan to intervene and participate in FERC licensing proceedings. FERC is very likely to be as eager to resolve quality/quantity differences during licensing as the environmental agencies, even if the respective viewpoints may not be the same. The State should set up a clearly defined process with specific assigned responsibilities to assure that proper State input is provided in FERC proceedings on new facilities.

(5) The best mechanism for the maintenance of an accord on minimum instream flows is to embody the accord in the FERC license with clarity and sufficient detail. The permit ought to encourage cooperative mechanisms to deal with any further problems that might arise in carrying out license provisions

on maintenance of instream flows. Informal dispute resolution should be stressed over immediate resort to administrative relief.

In the event of deadlock the FERC permit should provide for a speedy means of resolution and, if necessary, appellate review, since the delays inherent generally in the administrative process should not be allowed where water quality for a major river is at stake.

(6) The State might consider adopting legislation to identify quality/quantity problems before they arise and create mechanisms to encourage solutions relying upon compromise and accommodation. Where State action is required it should use existing agencies and programs.

(7) For the longer run, specific congressional attention to the problem of the competing of water quality and quantity is indicated. A congressional policy should not only enunciate a generally applicable policy but should describe a process for determining effective priorities in specific cases.

1. A general modernization of Vermont's water pollution control laws culminated in the adoption of Act 252, 1969 (Adj.Sess.) effective April 4, 1970.
2. A detailed description of the basin may be found in "Winooski River Basin Water Quality Management Plan"("WQMP"), Agency of Environmental Conservation, June, 1976, p.2-1 et seq.
3. See 3 V.S.A. Ch. 51.
4. See 30 V.S.A. Ch. 1.
5. 10 V.S.A. Ch. 47.
6. 10 V.S.A. §1269.
7. 10 V.S.A. §1270.
8. 10 V.S.A. §§1252-1258.
9. 10 V.S.A. §905(a)(12).
10. See, e.g., H.294, 1976 Legislature, Adj. Sess.
11. 30 V.S.A. §224 et seq.
12. 30 V.S.A. §248.
13. 30 V.S.A. §12.
14. See,e.g., Prouty v. Citizens Utilities Company, 150 F.Supp. 892, 899 (D.Vt. 1957), reversed on other grounds, 257 F.2d 692, cert. den. 358 U.S. 867,
15. 10 V.S.A. §1258(b); and see Opinion of the Attorney General to the Agency Secretary Martin L. Johnson 79-76, May 26, 1976. For a general review of the State response to the EPA mandate and an excellent insight into how the wasteload allocation procedures fit into Vermont's overall continuing planning process, see "State of Vermont Continuing Water Quality Management Planning Process," April 1978, Agency of Environmental Conservation, Department of Water Resources, Water Quality Division.

16. 3 V.S.A. Ch. 25.

17. WQMP, p. 10A-11.

18. The temporary "allocation" is not an allocation in a true sense, since no quantity limits for effluents are set, but rather limits on allowable concentrations. It is therefore fair to say that the 1976 WQMP did not have to confront the major issues to be raised by the adoption of true, permanent wasteload allocations.

19. Memorandum from Reginald A. LaRosa, Acting Commissioner of Water Resources, Agency of Environmental Conservation, Waste Allocation Task Force, December 5, 1977.

20. WQMP, p. vi. While flows lower than 7Q10 occurring naturally cannot be said to result in violations of water quality standards, artificially restricted flows falling below 7Q10 will be held to cause any resultant violation of water quality standards.

21. WQMP., pp. vii, iii.

22. Memorandum from Gary Schultz, Water Resources Assistant Planner to Richard M. Czaplinski, Water Resources Planner (both within Water Quality Division, Department of Water Resources, Agency of Environmental Conservation) April 13, 1977.

23. Vermont Department of Water Resources "Report on Water Quality and Pollution Control of the Lower Winooski River Basin, Vermont" (1968).

24. See Vermont Water Resources Board (June 9, 1969) Classification of the Lower Winooski River and its tributaries in the Counties of Chittenden, Addison, and Washington.

25. WQMP, p. 10A-6.

26. See "A Legislative History of the Water Pollution Control Act Amendments of 1972" (Comm. Print 1973) at 231, 1282. Cf. Union Electric Co. v. EPA, 427 U.S. 246 (1976).

27. The Water Resources Department has made efforts to acquire accurate stream flow data, using a series of consultants an modeling approaches. Data collection was completed during the summer of 1978, and an accurate stream flow model shoul be assembled before year's end.

28. WQMP, pp. 10A-9 - 10A-10.

29. See footnote 21, supra, p. 7.

30. 3 V.S.A. Ch. 25, specifically 3 V.S.A. 803.

31. Rule 7 states:

> "Hydrology. Water quality classification standards and associated requirements shall apply in all instances except during periods when the low natural stream flow is less than the consecutive seven (7) day mean low flow with a ten (10) year return period. On those rivers and streams whose rate of flow is artificially regulated, the flow shall not be reduced to a point where these standards and requirements governing water quality cannot be met nor shall such flow be regulated in such a way as to produce erosion or sedimentation with resulting discoloration or turbidity in excess of the limits provided in these regulations. The Secretary shall cooperate with appropriate federal, state, municipal and private interests in the development and maintenance of stream flow requirements.
>
> This rule shall in no way be construed to permit less than the normal design operation of any wastewater treatment facility during periods of low stream flow or to otherwise waive any discharge prohibitions or restrictions."

32. Lower Winooski Treatment Policy signed by Agency Secretary Brendan Whitaker, dated October 31, 1978.

33. We do not suggest that flow augmentation above 7Q10 is an acceptable alternative to adequate waste treatment.

34. 30 V.S.A. §248.

35. See, e.g., North v. City of Burlington, 125 Vt. 240, 214 A.2d 82 (1965).

36. 10 V.S.A. §1081.

37. 10. V.S.A. §1086.

38. 10 V.S.A. §1084. But where the dam is a hydroelectric dam, no minimum instream flows can be set that would affect the operation of the dam. See Attorney General's Opinion No. 83, 1968.

39. See Attorney General's Opinion No. 83, 1968.

40. 10 V.S.A. §1082. Nor does the chapter of Vermont law that purports to deal with regulation of stream flow lend assistance, as it does not apply at all to dams. 10 V.S.A. Ch. 41, §1021.

41. 10 V.S.A. §1004.

42. 16 U.S.C. §§707(e), 799, 800(b), 800(c), 817. See NAACP v. FPC, 520 F.2d 432, 437, 439 (D.C. Cir. 1975), aff'd 425 U.S. 662 (1976).

43. P. 26.

44. FERC only relicenses annually where a previous license has expired and has not yet been permanently renewed. 18 C.F.R. Part 16, §16.5. Relicensing would trigger NEPA review as a review of an ongoing policy. See Virginians for Dulles v. Volpe, 541 F.2d 442, 446 (4th Cir. 1976).

45. There is a mechanism for federal agencies to enter into formal agreements with each other, called a "Memorandum of Understanding", which could be used to develop an "institutional tie" on this issue. FERC and USEPA might be amenable to begin negotiating such a memorandum drafted or proposed by the State on this issue.

46. Conversation between Benson D. Scotch and Martin Inwald of FERC on May 19, 1978.

47. See footnote 14, supra.

48. In re Bellows Falls Hydroelec. Corp., 114 Vt. 443, 47 A.2d 409, 49 A.2d 561 (Vt. 1946).

49. A meeting was held December 15, 1977 between Thomas Willard and Gary Schultz of the Water Quality Division and Raymond Deforge and Kenneth Hadd of GMP.

50. Letter of Raymond Deforge to Reginald LaRosa dated April 4, 1978.

51. Letter of LaRosa to Deforge of April 14, 1978.